K.J. Somaiya Institute of Management Studies & Research
Course : PGDM– (Fin) IV – Batch: 2017-19 Trim End Term Exam
Sub : Derivatives and Risk Management

Date of Exam : 17/09/2019 Time : 3 hours Marks : 50

Note : **Q. No. 1** is **compulsory**. Answer **ANY THREE** complete questions from the rest.

Question 1
(20 Marks)

(a) On September 10, a currency trader observes that the USDINR spot rate is Rs.71.90 while the one-month rupee and dollar interest rates are 7.10% and 2.10% p.a. continuously compounded respectively. The one-month USDINR futures contract trades at Rs.72.63. Show clearly all steps needed to be taken to exploit the arbitrage opportunity. (10 marks)

(b) An automobile company sources a large number of its components from foreign suppliers and hence is exposed to the risk of depreciation of the rupee against the dollar. Evaluate different ways in which this company can mitigate its risk using forwards, futures and options, clearly enumerating the pros and cons of each hedging tool. (10 marks)

Question 2
(10 Marks)

(a) ABC Bearings Ltd wishes to borrow Rs.50 crore by issuing 6-month commercial paper on December 10. On September 10, this company enters into a 3X9 FRA with SBI at 7.20% with a notional principal of Rs.50 crore. Find the value of this FRA on October 10, given that the 2-month interest rate is 4.75% p.a and the 8-month interest rate is 6.50% p.a. Assume that there are 60 days and 242 days in the first period and second period respectively and consider 360 days in the year. (5 marks)

(b) "No hedge is better than a poor hedge". Justify this statement in the light of the Metellgesellscaft case. (5 marks)

Question 3
(10 Marks)

(a) Shares of Axis Bank trade at Rs. 651. A one-month European call option on Axis Bank shares with a strike price of 660 is trading at Rs.18. What should be the fair price of a one-month European put option on Axis Bank shares having the same strike price when the risk-free interest rate is 7.10% p.a.? If the put is actually trading at Rs.22.85, how will an arbitrageur exploit the arbitrage opportunity? Calculate the arbitrage gain if Axis Bank shares closes at Rs. 700 on the expiry date. (5 marks)

(b) What is 'basis risk'? State the reasons for the prevalence of basis risk in hedging with futures. (5 marks)

Question 4
(10 Marks)

(a) On September 10, shares of Maruti Ltd. are traded at Rs.8613. The share price has been steadily falling over the past few weeks and a trader feels that it is near a critical technical support level of 8602 which is unlikely to be breached easily. However, the trader is not very optimistic of the prospects of Maruti Ltd and expects the stock to be range-bound over the next few months owing to rupee depreciation and oil price risks. What option strategy is recommended in this situation, given the traded prices of options tabulated below? Justify your answer. (5 marks)

Strike price	Option type	Price
8700	Call	191.25
8700	Put	186.20
8600	Call	242.60
8600	Put	141.40
8500	Call	297.55
8500	Put	103.50

(b) State the five main determinants of the price of an option and explain how each of these affects the option price. (5 marks)

Question 5
(10 Marks)

(a) Using the Black-Scholes-Merton model calculate the price of a one-month European call option on shares of Tata Motors Ltd with a strike price of 280 when the current stock price is Rs.277.25, the risk-free interest rate is 7.10% per annum, and the volatility is 38% per annum. Use the z-tables. The formula is

Where and

(5 marks)

(b) In what ways do OTC-traded derivatives differ from exchange-traded derivatives? (5 marks)

Question 6 **(10 Marks)**

(a) Shares of ICICI Bank are traded at Rs.310. Compute the value of a one-year European call option on ICICI Bank Ltd at a strike price of Rs.300 using the binomial option pricing method and time steps of 6 months each. Assume that the share price can move up or down by 20% in each period and the risk-free interest rate is 7.10% p.a. continuously compounded (5 marks)

(b) "It is always better to exercise an American call option that is in-the-money. After all, a bird in hand is worth two in the bush." Is this statement correct? Explain. (5 marks)